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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/891,161

06/25/2001

Paul W. Jones

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06/04/2004

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EXAMINER

HUNG, YUBIN

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/891,161

Applicant(s)

JONES ET AL.

Examiner

Yubin Hung

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-19 and 21-23 is/are rejected.
- 7) ☒ Claim(s) 7 and 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08/16/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - P. 7, line 28: "the AC 3 coefficients" should have been "the 3 AC coefficients".Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 9, 11, 13-19, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US. 6,101,278) and Russo (US 6,546,122).
4. Regarding claim 1, and similarly claims 13 and 14, Chen et al. discloses
 - a) computing one or more selected DCT coefficients from non-overlapping, contiguous MxN blocks of the decompressed image, beginning at a selected offset;
[Fig. 1, numerals 4-6; Fig. 2, numerals 11, 12; Col. 4,, lines 18-26, 55-65. Note that the use of a selected offset (usually (0,0) if not specified) when applying DCT is inherent. Note also that the encoder (Fig.1, numeral 5) processes images decompressed by the decoder of Fig. 1, numeral 6.]
 - b) processing a set of values for each selected DCT coefficient obtained from the blocks of the decompressed image in order to identify a coefficient dispersion;
[Fig. 3, numeral S302; Fig. 6, numeral S601; Col. 6, lines 26-60 (generate a histogram over all blocks in the image for the coefficients

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at frequency band (0,1)); Col. 8, lines 58-67 (generate a histogram for each of the AC coefficients). Note that while "in order to identify a coefficient dispersion" indicates an intended use and is not considered by the Office as part of the limitation, it is nonetheless pointed out that the maximal auto-correlation value $D_{0,1}$ subsequently computed from the histogram for the coefficient at (0,1) is considered coefficient dispersion.]

Chen et al. does not expressly disclose the following, which Russo teaches

- c) repeating steps (a) and (b) for a plurality of offsets within an $M \times N$ block in order to identify the offset that minimizes the coefficient dispersion, thereby determining the block boundaries of the decompressed image
[Col. 2, lines 27-37 teach the iterative process recited in this limitation. The term "point of maximal match" is interpreted as the point (equivalent to "offset" here) that results in the optimal metric value such as the minimal coefficient dispersion. That the offsets are within an $M \times N$ block is obvious because of the cyclic nature of the DCT blocking grid. Again, note that while examined here, the text in this limitation beginning with "in order to" through the end indicates an intended use and is not considered by the Office as part of the limitation.]

Chen and Russo are combinable because they are from the same field of endeavor of image processing.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Chen et al. with the teaching of Russo by repeating the matching over a number of offsets. The motivation would have been to find the offset that produces the optimal match, since in template matching it is rare that the starting point yields the optimal match.

Therefore, it would have been obvious to combine Russo with Chen et al. to produce the invention as specified in claim 1.

5. Regarding claim 2, and similarly claim 15, they are rejected because Chen discloses the computation of coefficient histograms for the DCT coefficients as well as their corresponding dispersion metrics. (See the analysis of claim 1 above.)

6. Regarding claim 3, and similarly claim 16, they are rejected because note that Russo discloses the selection of the point of optimal match [Col. 2, lines 31-33] from the correlation values (i.e., the dispersion metrics) corresponding to the plurality of offsets. (See the analysis of claim 1 above.) Comparison is inherent in the selection process.

7. Regarding claim 4, and similarly claim 17, Chen et al. further discloses

- Wherein $M = 8$ and $N = 8$
[Col. 4, lines 21-26]

8. Regarding claims 5 and 6, and similarly claims 18 and 19, Chen et al. further discloses

- (Claim 5) wherein the decompressed image is a JPEG-decompressed image and
(Claim 6) wherein the decompressed image is an MPEG-decompressed image [Fig. 1, numerals 5, 6; Col. 4, lines 13-15, 55-57. Note that the encoder of numeral 5 processes images decompressed by the decoder of numeral 6]

9. Regarding claim 9, and similarly claim 22, note that per the analysis of claim 1 above, the offsets are confined to be within an $M \times N$ block. Since the object is to find the point (which is equivalent to the offset) of "maximal" match (or equivalently, the minimal dispersion) and no *a priori* knowledge is assumed, it is obvious to one of ordinary skill in the art at the time of the invention to use all the offsets so that the true maximal match can be selected, not one that is only very close to it.

10. Regarding claim 11, Chen et al. further discloses that the histograms of a plurality of DCT coefficients and their respective maximal auto-correlation values (i.e., the "dispersion metric") are computed [Fig. 6, numerals S601-S603; Col. 8, line 58 – Col. 9, line 59].

11. Claims 8, 10, 12, 21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US. 6,101,278) and Russo (US 6,546,122), as applied to claims 1-6, 9, 11, 13-19, 22 above, further in view of Watson (5,629,780).

12. Regarding claims 8 and 10, and similarly claims 21 and 23, Chen et al. and Russo disclose/teach everything (per the analysis of claim 1) except the following, which Watson teaches

- (Claim 8) wherein the one or more selected DCT coefficients is the DC coefficient
[Col 8, lines 45-52.]
- (Claim 10) wherein the decompressed image is a color image and steps a) through c) are completed for a luminance component of the color image
[Col. 3, lines 45-47; Col 8, lines 45-52.]

Chen, Russo and Watson are combinable because they are from the same field of endeavor of image processing.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Chen et al. and Russo with the teaching of Watson by selecting the DC coefficients and to perform steps of a) through c) on the luminance component of a color image. The motivation would have been to advantageously utilize the feature that visual thresholds increase with background luminance [Watson, Col. 2, lines 46-55]. The DC coefficients are used because they represent the average brightness (i.e., luminance) values of their respective blocks [Watson, Col. 7, lines 4-6].

Therefore, it would have been obvious to combine Watson with Chen et al. and Russo to produce the inventions as specified in claims 8 and 10, respectively.

13. Regarding claim 12, Watson further discloses

- wherein step a) further comprises the steps of scaling the DCT coefficients and rounding each DCT [Col. 1, lines 58-64]

Allowable Subject Matter

14. Claims 7 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
May 28, 2004



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